

REMARKS

Claims 13-32 active. Page 1 of the specification has been amended to correct minor typographical errors. Claims 13 and 14 respectively track prior Claims 4 and 5. Claims 30 and 31, respectively track prior Claims 2 and 3. The water content range of Claim 13 finds support in the specification on page 6, lines 21-25. Film with a width of at least 2 m as described by Claim 15 finds support on page 7, line 16, of the specification. The second drying surface of Claim 16 is described on page 5, line 14, of the specification. Claims 17-19 find support in original product Claims 10-12, as well as in original method Claims 1-9. Films having differences in retardation of 5 nm, 4 nm or 3 nm as described by Claims 20-22 are described on page 7, lines 3-5, of the disclosure. Films having the thicknesses and widths described by Claims 23-25 are described on page 7, second full paragraph, of the disclosure. Films produced using PVA with the degree of polymerization or degree of hydrolysis of Claims 26-29 are described on page 9, lines 13-26, of the specification. Claims 30 and 31 track and find support in original Claims 2 and 3 as noted above. Support for liquid crystal displays comprising the film of the invention is found on page 1, second paragraph, and page 2, lines 22-28. Accordingly, the Applicants do not believe that any new matter has been added.

The Applicants thank Examiner Reddick for the courteous and helpful interview of June 11, 2003. The Applicants were encouraged to clarify the claim set to address the claim objections and indefiniteness rejections. The Examiner indicated that it would be helpful to present experimental data showing differences between the prior art films and the films of the present invention. Applicants have now clarified and reorganized the claim set and present such experimental data in the attached Declaration. Favorable consideration of the above amendment is respectfully requested.

Allowable Subject Matter

The Applicants thank Examiner Reddick for indicating that the subject matter covered by method Claims 4-9 would be allowable. As Claims 13 and 14 are based on prior Claims 4 and 5, they should be allowable. Claims 15 and 16 depend from Claim 13 and should also be allowable. The process of Claim 13 is free of the prior art and, therefore, the Applicants submit that a film produced by this process, such as the films of Claims 17-19, would also be free of the prior art. As discussed below, the Applicants also believe that the subject matter covered by Claims 20-32 would be free of the prior art.

Objection to the Specification/Abstract

The specification was objected to as lacking an Abstract. A copy of the original Abstract is appended to this response. Accordingly, this objection may be withdrawn.

Objections to the Claims

Claims 10-12 were objected to as being in improper form under 37 C.F.R. 1.75(C). The Applicants submit that these objections may be withdrawn in view of the cancellation of these claims.

Rejection—35 U.S.C. 112, second paragraph

Claims 7-9 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite. These rejections are moot in view of the cancellation of these claims.

Rejection—35 U.S.C. 102(b) or 103(a)

Claims 1-3 were rejected under 35 U.S.C. 102(b) as being anticipated by, or in the alternative, under 35 U.S.C. 103(a) as being obvious over JP 5337967, Marks, U.S. Patent 2,997,544 or Ichikawa et al., U.S. Patent No. 4,387,133. This rejection is moot in view of the cancellation of Claims 1-3. It would not apply to new product Claims 17-32 for the following reasons:

JP5337967 does not anticipate or render obvious the claimed films, because it is directed to a method in which a PVA film is dried up to a water content less than 10%, and then peeled off. For the convenience of the Examiner, the Applicants have attached a partial English translation of JP5337967. Page 1 of this translation as it refers to col. 2, lines 6-14, indicates that “the water content of the film at the stripping stage from the casting base material is controlled under 10% by weight”. Present Claim 13 requires a water content in the range of 10-50% and the films produced by the method of Claim 13 have distinct properties based on their production by such a method. Moreover, as required by Claim 14, JP5337967 does not disclose nor suggest the features of drying both the surfaces of the PVA film by the first and second drying surfaces, respectively, and peeling off the PVA film from the first drying surface when the water content is within the range from 10 to 50%. Accordingly, films, such as those produced by the methods of Claims 13-19 are not anticipated by or obvious over JP5337967.

Films produced by the methods of the present invention have distinct physical properties from films produced by the prior art, such as those produced in JP5337967. The attached Declaration shows that films produced by the method of JP5337967 are wrinkled and comprise wrinkled sections where the difference in retardation between two points separated by 1 cm along the TD direction is greater than 5 nm. The films of the present invention, see e.g., Claims 17-22, are required to have a difference in retardation of 5 nm or

less. The attached Declaration, see e.g., page 4, line 2, shows that film produced by the method of JP5337967 comprises a wrinkle imparting a difference in retardation of two points separated by 1 cm of 10 nm, which is outside the range required by the present invention. The presence of this wrinkle in the prior art film produces undesirable color irregularities.

As discussed in the Specification on page 2, lines 10-21, many attempts have been made to reduce color irregularities, such as decreasing thickness irregularity or birefringence irregularity. It has been found that it is difficult to reduce color irregularities at the level problematical in the final product (polarizer) having recent increased performance. Further, it has been found that the decrease of thickness irregularity or birefringence irregularity can not be an effective solution to reduce color irregularities, since even if thickness irregularity and birefringence irregularity are evaluated as irregularities of the whole film surface, they do not correctly correspond to actual color irregularities perceived by human eyes.

JP5337967 is within the range of the prior art discussed in the subject specification. JP5337967 takes up the thickness irregularity and the birefringence irregularity at points in 5 cm pitch (paragraph [0022] in the partial English translation), and does not recognize retardation differences within such small region of about 1 cm pitch as in the present invention.

To show the differences between the film of JP5337967 and that of the present invention, PVA film was obtained under the conditions specified in Example 1 of JP5337967 and then subjected to the same treatment as in Example 1 of the subject specification to produce a polarization film. The resultant PVA film and polarization film were evaluated. The test results and methods are presented in the Declaration and show that a PVA film with a small retardation difference within a small region of 1 cm pitch cannot be obtained due to the frequent occurrence of wrinkles. PVA films made by the method described by JP 5337967, had wrinkles and thus exhibited a value in retardation between two points separated

by 1 cm of the PVA film of 10 nm where the wrinkle occurred (see page 4, line 2, of the Declaration). The wrinkle occurred in the PVA film due to lowered adhesiveness of the PVA film with the stainless steel belt due to low water content (e.g., 9.0% by weight, see page 3, line 19, of the Declaration) of the PVA film at the stripping stage. When polarization films were produced from these PVA films, they contained color irregularities due to dyeing irregularities where the wrinkle occurred and thus were considered inappropriate as a final product. See page 4 of the attached Declaration. Accordingly, by the use of such PVA film of JP5337967 any polarization film of good enough quality with small retardation difference can not be industrially produced.

On the other hand, the method of the invention produces a film characterized by a difference in retardation between two points separated by 1 cm along the TD direction of the film of 5 nm or less. Claims 14-17 explicitly require that the water content of the PVA film when peeled after passing the first drying surface range from 10-50% as thus would produce films which differ from that of JP5337967, which has a lower water content (e.g., 9.0% by weight) at the stripping stage. The water content when the film is peeled off from the first drying surface is also important, because when the water content is over 50% by weight, color irregularities occur when the film is made into a polarization film and a good quality polarization film is not obtained, and further, retardation irregularity of the PVA film within a small region of about 1 cm increases easily, see the specification, page 6, lines 25-29. When the water content is less than 10%, the PVA film tends to be peeled off too early because of a poor adhesiveness between the film and the two drying surfaces. Accordingly, by using the claimed methods a wrinkle is not manifested in stretching and the retardation irregularity within a small region of about 1 cm does not increase easily, see the specification, page 5, lines 7-12.

Unlike the wrinkled films produced by the method of JP5337963, which comprise a wrinkle having a difference in retardation along the TD direction of the film of 10 nm, films produced by the methods of Claims 13-17 are characterized by a difference in retardation between two points separated by 1 cm along the TD direction of the film of 5 nm or less. As described by page 3, lines 6-22, of the specification, the film of the invention manifests fewer color irregularities and furthermore does not easily produce wrinkle in stretching. The suppression of the wrinkling problem is specifically remarkable in the film having a width of 2 m or more, see e.g., the specification, page 7, lines-14-19.

An additional feature of Claim 15 is the “multi-stage drying process in which one side of the film is dried by the first drying surface and the other side of the film is dried by the second drying surface” and “setting the water content of the film within the range from 10 to 50%”. By drying the one side of the film by the first drying surface and the other side of the film by the second drying surface, the film is dried uniformly from the both sides of the film and hence, the quality of PVA film is improved so that color irregularities in the final product (polarization film) do not occur.

Thus, since JP5337967 does not disclose nor suggest the claimed PVA film or the method of producing such film which reduces color irregularities at the level problematical in the final product (polarizer) having recent increased performance, the Applicants submit that this document does not anticipate or render obvious the present claims.

Marks, U.S. Patent No 2,897,544, does not disclose or suggest the features of method Claims 13-19, or the film products made using these methods. Color irregularities of a polarization film have been recognized in the last 20 years. Marks is older than that and thus would not give any consideration to improving performance of a PVA film, which is a material for a polarization film, to reduce color irregularities of polarization films at the time of filing of Marks or in 1953. Thus, Marks does not disclose nor suggest a PVA film

capable of reducing color irregularities in the final product (polarizer) or method of making such film.

Ichikawa et al. (USP 4,387,133) is characterized in that a polymeric supporting film or sheet having heat distortion temperature of not lower than 80°C and retardation value of not higher than 30 millimicrons is used in place of conventional glass supporting member for liquid crystal display devices. No specific reference to a PVA film is found in Ichikawa. More specifically, while in Ichikawa a light-polarizing film corresponds to the PVA film of claim 1 of the subject invention, no reference to such light-polarizing film is found in Ichikawa except “polyvinyl alcohol-iodine systems”, (col. 2, line 43), “polyvinyl alcohol-dichroic dyes (col. 2, line 58) and “polyvinyl alcohol-iodine light-polarizing film” (col. 13, line 13).

No reference to the problems raised in the subject specification and no reference to a method for producing the light-polarizing film are disclosed or suggested in Ichikawa. Ichikawa does not teach or suggest the PVA film of the subject invention which reduces color irregularities of the final product (polarization film) or disclose or suggest a method for producing such PVA film. Thus, the present claims are not anticipated by or obvious over Ichikawa. Accordingly, the Applicants submit that this rejection would not apply to the present claims.

CONCLUSION

In view of the above amendments and remarks, the Applicants respectfully submit that this application is now in condition for allowance. Early notification to that effect is ardently solicited.

Respectfully Submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER, & NEUSTADT, P.C.



Norman F. Oblon  
Attorney of Record  
Registration No.: 24,618

Tel.: (703) 413-3000  
Fax: (703) 413-2220  
NFO/TMC/cja

Thomas M. Cunningham  
Registration No. 45,394